

**Clean set of complete claims as amended on 08/08/02**

53. (Twice Amended) A semiconductor wafer fabrication system comprising:
- a sealed chamber for processing said semiconductor wafer having a first surface and a second surface; and a head assembly comprising:
- a modulated light source exposing at least a portion of said semiconductor wafer to light having a wavelength and modulated at a frequency; and
- a surface photovoltaic sensor comprising a plurality of electrodes positioned adjacent said first surface to detect a surface photovoltaic induced at said first surface of said semiconductor wafer in response to said light without contacting said wafer, said plurality of electrodes sufficient for detecting said surface photovoltaic on said first surface; and
- said surface photovoltaic sensor of said head assembly located within said sealed chamber.
54. The semiconductor wafer fabrication system of claim 53 wherein said sealed chamber is a reduced pressure chamber.
55. The semiconductor wafer fabrication system of claim 53 wherein said sealed chamber is a chemically reactive gas chamber.
56. The semiconductor wafer fabrication system of claim 53 wherein said sealed chamber is an inert environment chamber.
57. The semiconductor wafer fabrication system of claim 53 wherein said head assembly is entirely located within said sealed chamber.